ENTOMOLOGICAL NEWS

OCTOBER 1957

Vol. LXVIII **No. 8**

CONTENTS

Mockford—Psocoptera from Tikal, Guatemala 197

Porter—A new subspecies of Megarhyssa atrata 206

Burks—A new Profenusa (Hym.: Tenthr.) 207

Woolley—Redescriptions of Ewing's Oribatid mites, IV 177

Sanderson—Status of the tortoise beetle M. ormondensis 222

Nomenclature notice 223

Books received 223

PUBLISHED MONTHLY, EXCEPT AUGUST AND SEPTEMBER, BY
THE AMERICAN ENTOMOLOGICAL SOCIETY
PRINCE AND LEMON STS., LANCASTER, PA.
AND
1900 RACE STREET, PHILADELPHIA 3, PA.

Subscription, per yearly volume of ten numbers: $5.00 domestic; $5.30 foreign; $5.15 Canada. Entered as second-class matter April 19, 1943, at the post office at Lancaster, Pa., under the Act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for in paragraphs (d-2), Section 34.40, P. L. & R. of 1948, authorized April 19, 1943.

ENTOMOLOGICAL NEWS

ENTOMOLOGICAL NEWS is published monthly, excepting August and September, by The American Entomological Society at Prince and Lemon Sts., Lancaster, Pa., and the Academy of Natural Sciences, 1900 Race Street, Philadelphia 3, Pa., U. S. A.

PHILIP P. CALVERT, Editor Emeritus. R. G. SCHMIEDER, Editor. Editorial Staff: H. J. GRANT, JR., E. J. F. MARX, M. E. PHILLIPS, and J. A. G. REHN.

Subscription price, per yearly volume of 10 numbers: Domestic, $5.00; Foreign, $5.30; Canada, $5.15—U. S. Currency.

SUBSCRIPTIONS: Communications and remittances to be addressed to **Entomological News, 1900 Race Street, Philadelphia 3, Pa.**

ADVERTISEMENTS: Rate schedules available on request. Address, **Fred B. Jacobson, Advertising Manager, Entomological News, 1900 Race Street, Philadelphia 3, Pa.**

MANUSCRIPTS and all communications concerning same should be addressed to **R. G. Schmieder, Zoological Laboratory, University of Pennsylvania, Philadelphia 4, Pa.**

The receipt of all papers will be acknowledged and, if accepted, they will be published as soon as possible. Articles longer than eight printed pages may be published in two or more installments, unless the author is willing to pay the cost of a sufficient number of additional pages in any one issue to enable such an article to appear without division.

ILLUSTRATIONS: Authors will be charged as follows: For text-figures, the cost of engraving; for insert plates (on glossy stock), the cost of engraving plus printing. Size limit, when printed, 4×6 inches. All blocks will be sent to authors after printing. It is not advisable to print half-tones as text-figures.

TABLES: The cost of setting tables will be charged to authors.

SEPARATA: Members of the American Entomological Society may elect to receive, gratis, 25 offprints of their contributions. These will be "run-of-form," without removal of extraneous matter.

Those members desiring more than 25 separates, and all non-members, will receive no gratis copies. They must obtain all their separates (as reprints, with extraneous matter removed) from the printer at the prices quoted below. Authors must place their order for such separates with the editor at the time of submitting manuscripts, or when returning proof.

Copies	1–4 pp.	5–8 pp.	9–12 pp.	13–16 pp.	17–20 pp.	Covers
50	$3.95	$6.33	$ 9.89	$10.28	$13.44	$4.31
100	4.74	7.51	11.86	12.65	16.21	5.89
Add'l 100	1.58	2.36	3.94	4.74	5.54	3.16

Plates printed one side: First 50, $3.15; Additional 100's, $2.37.

Transportation charges will be extra.

ENTOMOLOGICAL NEWS

VOL. LXVIII OCTOBER, 1957 No. 8

Some Psocoptera from Tikal, Guatemala

By EDWARD L. MOCKFORD, Illinois Natural History Survey, Urbana, Illinois

The psocids discussed in this paper were collected at Tikal, Department of Peten, Guatemala, in late winter and spring of 1956 by Dr. Irving J. Cantrall of the University of Michigan Museum of Zoology, Ann Arbor. The material consists of seven specimens representing seven species, seven genera, and four families. Five of the species are new and are described below; the other two may be new. To my knowledge, these are the first published records of Guatemalan psocids. The meagre information on psocids of Central America in general suggests that a very rich fauna must exist in that region.

Two genera used in this paper have not previously appeared in the New World literature. The genus *Ghesquierella* Badonnel is based on African material, but the similarities between the Guatemalan species and the African genotype are sufficiently striking to indicate a probable close relationship. The genus *Psocidus* Pearman was erected to include all forms in the Psocidae which cannot be placed in one of the existing genera. Until the relationships of such forms become better understood, it seems advisable to continue using *Psocidus* in this way rather than to erect new genera.

FAMILY PTILONEURIDAE

Loneura splendida new species (♀)

Diagnosis: Near *L. brasiliensis* Roesler, differing in the following forewing characters: cell R_{2+3} proportionally much

longer; a premarginal band of connected spots from vein M_3 to R_{4+5}; each spot centered on a vein. Clouded area below vein Cu_1 much larger than in *L. brasiliensis,* extending below vein An.

Measurements: Total body length 2.97 mm.; forewing length 4.93 mm.; hindwing length 3.24 mm.; posterior tibia length 2.07 mm.; posterior tarsus length—T_1 0.84 mm., T_2 0.06 mm., T_3 0.15 mm.

Morphology: Ocelli close together on a prominent ocellar interval; anterior ocellus smaller than posteriors. IO/D = 1.22, PO/D = 0.78. Lacinia broad distally, with an apical toothed area separated by a notch from a large preapical tooth. Maxillary palpi long and slender; terminal segment nearly as long as the preceding two segments together. Middle and posterior tarsi each with a single row of ctenidia, with the numbers per segment as follows: middle tarsus—T_1 17, T_2 1, T_3 3; posterior tarsus—T_1 24, T_2 1, T_3 4. Wing venation and ciliation similar to that of *L. brasiliensis,* the chief differences being in forewing, where Rs from the point where it leaves *r-m* crossvein to the point where it forks proportionally much shorter than in *L. brasiliensis,* whereas radial fork proportionally much longer; vein M_3 branched in right wing, the anterior branch rebranching in left wing. Subgenital plate with rounded posterior margin; pigmented area of subgenital plate in form of a broad U, ends of which are curved outward. Gonapophyses (Fig. 7): first valvula slender, about three-quarters length of second valvula, bearing a few tiny spines near apex; second valvula with recurved apex, bearing numerous slender spines; rudimentary third valvula bearing only a few hairs. Interior genital plate (Fig. 8) nearly as large as subgenital plate. Paraprocts bearing many hairs and near their median margins numerous small, slender spines. Epiproct bearing numerous hairs.

Color (in alcohol): Compound eyes black. Body generally straw colored, marked with deep brown distributed as follows: entire clypeus and labium; a band across vertex immediately above ocelli, but dipping down to include ocellar interval; large blotches involving most of thoracic pleura and terga (some blotches pale brown on terga); all coxae and femora, except a

pale preapical band on each femur. Antennae straw colored with a colorless apical band on each flagellar segment. Wings marked as indicated in the diagnosis and in Figs. 1 and 2.

Type locality: GUATEMALA: Department of Peten, Tikal. April 5, 1956, at light, I. J. Cantrall collector. The type is in my collection.

Triplocania spinosa new species (♂)

Diagnosis: Differs from the other neotropical species of its genus in wing markings, possessing a premarginal band in the forewing from vein M_3 to R_{4+5}, in contrast to a marginal band in *T. magnifica* Roesler, *T. reflexa* Roesler, and *T. marginepicta* Roesler, and no band in *T. lucida* Roesler and *T. dolosa* Roesler. Curvature of veins in forewing most similar to that of *T. reflexa,* but differing in the marked flexure of R_{2+3}, M_2, and M_3, and in the less marked flexure of the distal edge of the areola postica.

Measurements: Total body length 2.32 mm. (abdomen contracted); forewing length 4.44 mm.; hindwing length 3.18 mm.; posterior tibia length 2.07 mm.; posterior tarsus length—T_1 0.90 mm., T_2 0.21 mm.

Morphology: Compound eyes very large and prominent, IO/D = 0.93, PO/D = 1.00. Mouthparts typical of the Epipsocetae, as described for the preceding species. Middle and posterior tarsi each with a single row of ctenidia, with their numbers per segment as follows: middle tarsus—T_1 20, T_2 3: posterior tarsus—T_1 30, T_2 4. Hypandrium (Fig. 3) with a small, weakly sclerotized central lobe and a pair of well sclerotized lateral lobes curving medially and bearing numerous denticles. A complex set of phallic sclerotizations dorsal to the parameres (Fig. 12).

Color (in alcohol): Compound eyes and ocellar interval black. Body generally straw colored, marked with various shades of brown. Deep brown lines indicating some of the clypeal striations, but not attaining mid-line. Bands of deep brown around antennal bases. Forewings marked as indicated in Fig. 4 and in the diagnosis. Antennae mostly straw colored with deep

brown basal and preapical bands on each of the flagellar segments, except no basal band on f_1, and a colorless apical band on each flagellar segment.

Type locality: GUATEMALA: Department of Peten, Tikal. February 14, 1956, at light, I. J. Cantrall collector. The type is in my collection.

FAMILY EPIPSOCIDAE

Epipsocus petenensis new species (♀)

Diagnosis: A species of the subgenus *Epipsocus,* near *E. latistigma* Roesler and *E. serenus* Roesler, differing markedly from either of these in the shape and color pattern of the pterostigma, and in the much larger size of the dark spot associated with the distal end of the anal vein in both fore- and hindwings.

Measurements: Total body length 2.64 mm.; forewing length 3.51 mm.; hindwing length 2.46 mm.; posterior tibia length 1.59 mm.; posterior tarsus length—T_1 0.75 mm., T_2 0.15 mm.

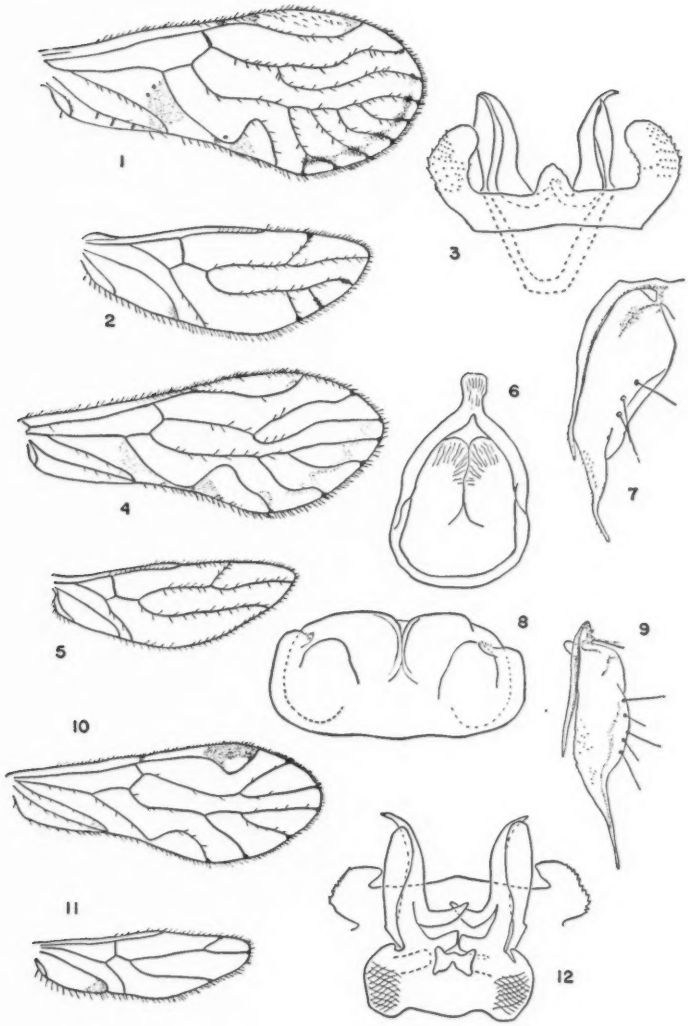
Morphology: IO/D = 1.33, PO/D = 1.00. Mouthparts of usual form for the Epipsocetae. Middle and posterior tarsi each with a single row of ctenidia, the numbers per segment as follows: middle tarsus—T_1 22, T_2 0; posterior tarsus—T_1 34, T_2 4. Pterostigma decidedly clavate; venation otherwise normal for the genus. Subgenital plate of usual form for the genus. Gonapophyses as in Fig. 9; second valvula bearing numerous tiny denticles on its inner edge.

Color (in alcohol): Compound eyes and ocellar interval black. Body generally straw colored marked with brown. A brown

---

EXPLANATION OF FIGURES

FIGS. 1–2. *Loneura splendida* n. sp. ♀, 1. forewing, 2. hindwing.
FIGS. 3–5. *Triplocania spinosa* n. sp. ♂, 3. hypandrium and phallic sclerites, ventral aspect, 4. forewing, 5. hindwing.
FIG. 6. *Ghesquierella cantralli* n. sp. ♂, phallic frame.
FIGS. 7–8. *Loneura splendida* n. sp. ♀, 7. gonapophyses, 8. interior genital plate.
FIGS. 9–11. *Epipsocus petenensis* n. sp. ♀, 9. gonapophyses, 10. forewing, 11. hindwing.
FIG. 12. *Triplocania spinosa* n. sp. ♂, hypandrium and phallic sclerites, dorsal aspect.


1
2
3
4
5
6
7
8
9
10
11
12

blotch around each antennal base, extending to ocellar interval. Brown lines along upper clypeal striae. A pair of brown spots postero-lateral to ocelli. Thoracic pleura and coxae mostly brown. Femora brown basally, paling apically. Wings mostly hyaline with brown markings as indicated in Figs. 10 and 11, and in the diagnosis. Antennae colorless.

Type locality: GUATEMALA: Department of Peten, Tikal. March 24, 1956, on laboratory table in camp, I. J. Cantrall collector. The type is in my collection.

FAMILY MYOPSOCIDAE

Lichenomima sp.

A single female was taken at a light, February 8, 1956. Although it may represent a new species, it is very similar in wing markings and genitalia to *L. sparsa* (Hagen) and an undescribed U. S. species.

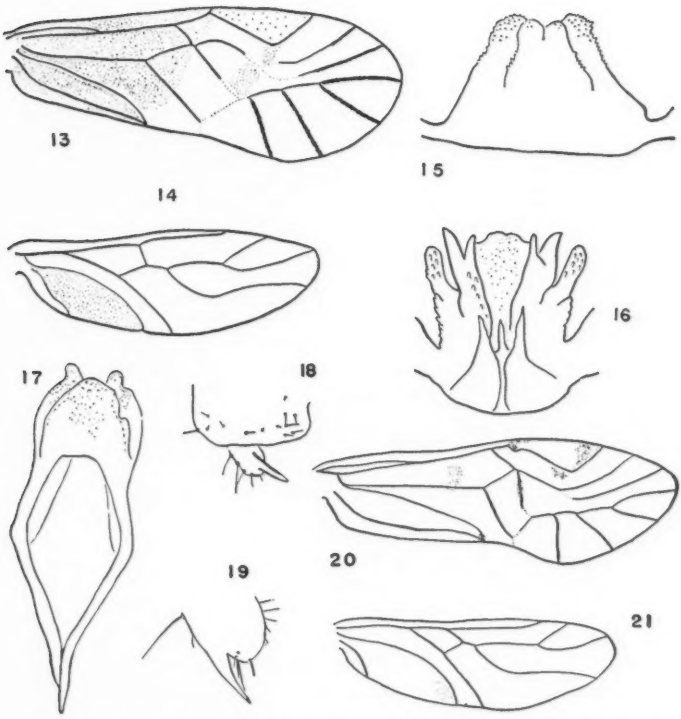
FAMILY PSOCIDAE

Psocidus tikalus new species (♂)

Diagnosis: Probably belongs in subfamily Psocinae, but its relationships otherwise unknown.

Measurements: Total body length 3.45 mm.; forewing length 4.29 mm.; hindwing length 3.18 mm.; posterior tibia length 1.86 mm.; posterior tarsus—T_1 0.60 mm., T_2 0.21 mm.

Morphology: Compound eyes very large; IO/D = 1.06, PO/D = 1.00. Ocelli large, the ocellar interval decidedly prominent. Antennae clothed in short hairs; first flagellar segment slightly thickened basally, gradually becoming narrower apically; the thickened portion bearing three discoid sensillae (flagellum broken off in second segment on left side and after third on right). All tarsi with a single row of ctenidia, the numbers per segment as follows: anterior tarsus—T_1 15, T_2 0; middle tarsus —T_1 20, T_2 0; posterior tarsus—T_1 31, T_2 5. Wing venation as in Figs. 20 and 21; forewing with tapering apex. Weak, unpigmented section of vein R_s restricted to base of R_{4+5}. Fu-



FIGS. 13–15. *Ghesquierella cantralli* n. sp. ♂, 13. forewing, 14. hindwing, 15. hypandrium.
FIGS. 16–18. *Psocidus tikalus*, n. sp. ♂, 16. hypandrium, 17. phallic frame, 18. apex of paraproct.
FIG. 19. *Ghesquierella cantralli* n. sp. ♂, apex of paraproct.
FIGS. 20–21. *Psocidus tikalus* n. sp. ♂, 20. forewing, 21. hindwing.

sion of R_s and M in forewing very short. Pterostigma deep and angular. Hypandrium (Fig. 16) nearly symmetrical, produced into three processes on each side, the processes and central area denticulate. Phallic frame shaped as in Fig. 17, apex denticulate. Each paraproct with a slender, pointed process on its apex as in Fig. 18.

Color (in alcohol): Compound eyes and ocellar interval black. Body generally pale gray marked with brown as follows: striations on upper half of clypeus; two transverse bands on vertex between eyes (both passing through ocellar interval); pair of spots on vertex postero-lateral to ocelli; anterior portions of alinota; irregular blotches on pleural regions of thorax; narrow segmental rings on abdomen. Wings marked as in Figs. 20 and 21. Legs pale gray except for cloudy apical band on each femur, and brown second tarsal segments on all legs. First flagellar segment pale brown; remainder dark brown (broken off beyond third flagellar segment).

Type locality: GUATEMALA: Department of Peten, Tikal. April 3, 1956, I. J. Cantrall collector. The type is in my collection.

Ghesquierella cantralli new species (♂)

Diagnosis: Agrees with genotype, *G. calensis* Bad., in structure of the hypandrium, shape of forewing and of most of its cells (notable exceptions being the narrower, bent cell R_{2+3} and narrower An in *G. cantralli*), presence of a mark below pterostigma and another below that in cell R_5, and pattern of dark-bordered veins in forewing. Differs from the genotype in possessing a pair of spiny lateral areas on hypandrium, a fumose basal portion of forewing, and in shape of the apex of the phallic frame. In forewing, vein Sc joins radial stem in *G. cantralli* but not in *G. calensis*.

Measurements: Total body length 3.36 mm.; forewing length 4.93 mm.; hindwing length 3.60 mm.; posterior tibia length 2.04 mm.; posterior tarsus—T_1 0.57 mm., T_2 0.24 mm.

Morphology: Compound eyes small; IO/D = 2.33, PO/D = 0.90. Ocellar interval not prominent. Anterior ocellus smaller

than posteriors. Antennae clothed in rather long, curved hairs. First flagellar segment with two discoid sensillae near its base. Antennae broken off, but probably much longer than forewing as right antenna to basal part of f_4 equals length of forewing. Distribution of tarsal ctenidia: none on anterior tarsus; middle tarsus—T_1 15, T_2 4; posterior tarsus—T_1 23, T_2 5. Wing venation (Figs. 13 and 14) much as in the genotype, differing as indicated in the diagnosis. Hypandrium (Fig. 15) nearly symmetrical, produced apically into a central lobe bordered on each side by a row of spines, and a spiny lobe on each side. Phallic frame as in Fig. 6, its apex shaped somewhat as in *Psococerastis*. Paraprocts each with a large sensory area about midway between base and apex, and a slightly curved apical process (Fig. 19).

Color (in alcohol): Compound eyes, inner rims of ocelli, flagella, and distal two segments of maxillary palpi black. Body generally orange. Legs straw colored basally, becoming nearly black on tarsi. Forewings fumose basally, hyaline apically except for dark borders of veins and two spots below pterostigma; pterostigma orange. Hindwings hyaline except for faintly fumose anal cell.

Type locality: GUATEMALA: Department of Peten, Tikal. February 14, 1956, I. J. Cantrall collector. The type is in my collection.

Metylophorus sp.

A single male was taken April 6, 1956. It is very similar to *M. novaescotiae* (Walker), a species common throughout Eastern U. S. The only differences noted were the slightly smaller body size and proportionally much larger size of the compound eyes of the Guatemalan form. There may be differences in the numbers of teeth on the hypandrial ridges, but the extent of variation in these numbers in *M. novaescotiae* is not known. These differences may prove to be clinal or subspecific when additional material becomes available.

A New Subspecies of Megarhyssa atrata (Fabricius) (Hymenoptera: Ichneumonidae)

By Charles C. Porter

The subject insect was discovered as a result of a more or less preliminary study of the Rhyssini in the collection of the American Museum of Natural History. At the outset, therefore, I express my thanks to Miss Alice Gray and Dr. C. H. Curran of that institution, the two of whom very kindly made it possible for me to pursue these investigations, and to Dr. H. K. Townes for his help in verifying my findings.

The subspecies may be recognized as follows:

Megarhyssa atrata lineata, new subspecies

Exactly similar to typical form in structure, size, and general habitus. Distinguished by the following color characteristics: A line on the upper margin of prothorax, similar line on its lower front margin, pair of central vittae on mesonotum, scutellum except extreme base, the postscutellum, spot below tegulae of both anterior and posterior wings, thin lateral line on first two sternites and their apices narrowly, yellow. General color somewhat more brownish than in typical form, central lobe of mesoscutum anteriorly especially so, forming a marked contrast with the black lateral lobes. Wings perfectly hyaline, with no trace of the deep infumation so characteristic of *M. atrata atrata.* Color otherwise precisely as in typical form.

The type series consists of two females collected by Mrs. A. T. Slosson at Franconia, New Hampshire. Types are deposited in collection of American Museum of Natural History.

In conclusion, it would seem that this represents the extreme northern development of *M. atrata.* In this conclusion Dr. Townes fully concurs. Certainly there is nothing like it among the many specimens I have examined from more southerly localities.

A New Profenusa from the California Plane Tree (Hymenoptera, Tenthredinidae)

By B. D. Burks, Entomology Research Division, Agricultural Research Service, United States Department of Agriculture

In the fall of 1956 I received from Dr. L. R. Brown, of the University of California at Los Angeles, specimens of a small sawfly for identification. These had been reared by Mr. Clark O. Eads at Santa Barbara and Santa Monica, California, from leaf mines on the California plane tree, *Platanus racemosa,* during May and June of 1956. The information supplied with the specimens was that they had developed from larvae which lived in leaf mines superficially resembling those made by the gracilariid moth *Lithocolletis felinella* (Heinrich) on the same tree. Both the moth and the sawfly make blotch mines.

Study of these sawfly specimens showed that they represented an undescribed species of the genus *Profenusa* MacGillivray, as defined by Benson (1941, Proc. Roy. Ent. Soc. London, ser. B, 10: 85–90). This genus in the Nearctic region contains the species *alumna* (MacGillivray), which mines *Betula* leaves; *canadensis* (Marlatt), mining *Crataegus* leaves; *inspirata* (MacGillivray), the host of which is unknown; and *lucifex* (Ross), also of unknown host. The host likewise is unknown for the closely related *Setabara histrionica* (MacGillivray).

Profenusa platanae, new species

This species most closely resembles *P. inspirata* (MacGillivray) in being mostly black and in having the ovipositor sheaths exserted. The two differ in that the sheaths in *inspirata* are broad and short, while they are slender and long in *platanae,* see Fig. 4. In *inspirata* (see Ross, 1936, Trans. Ill. Acad. Sci. 29: 264, Fig. 2) the lancet of the saw has the ventral margins between the apical 4 lobes minutely serrulate, while these margins are smooth in *platanae,* Fig. 1; the lobes in *inspirata* have extremely minute sub-denticles, but in *platanae* each lobe bears 4 relatively large teeth. *P. platanae* differs from *Setabara his-*

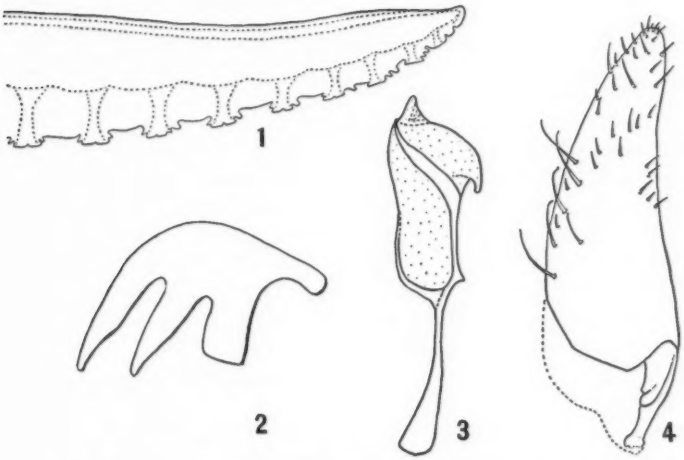
trionica (MacGillivray) in having cell R_1 of the hind wing open rather than closed; the two differ also in that *histrionica* does not have the ovipositor sheaths exserted and has the hind tibia almost completely brown. The hind tibia in *platanae* is almost entirely yellow.

Female: Length, 4.0 mm. Head and body black; antenna black, with narrow band at apex of pedicel yellow and apical segment of flagellum very dark brown; tegula mostly yellow, a small dorso-basal area black; wings hyaline with venation brown; apices of all femora, fore and middle tibiae, and all tarsi yellow, coxae and basal area of each femur black, second trochanter of each leg dark brown, hind tibia yellow with apex shaded with dark brown.

Surface of head and body smooth, shining; fronto-vertex and temples of head densely clothed with fine, golden hair; clypeus, labrum, and normally exposed portions of mandibles clothed with slightly sparser and longer golden hair; pronotum laterally setose, mesonotum glabrous, dorsal half of mesepisternum finely setose, this sclerite ventrally glabrous; all coxae apically setose, trochanters densely setose, femora sparsely setose, tibiae and tarsi very densely setose; dorsum of abdomen glabrous, venter very sparsely setose; exserted ovipositor sheaths each with 6 to 8 rather long, slightly curved setae and a few short hairs, Fig. 4.

Head with genae acarinate laterally; relative proportions of parts of antenna: Scape 33, pedicel 25, first flagellar segment 50, second 35, third 30, fourth 30, fifth 25, sixth 25, seventh 25; pedicel twice as long as wide. Forewing with crossvein 2r joining Rs basad of 3r-m, first abscissa of Rs wanting or very faintly indicated, 2r-m very short; vein M with portion between 1m-cu and 2r-m and just distad of 2r-m, and crossvein 2m-cu minutely fractured, similar minutely fractured sectors in 2r and 3r-m; vein 2A very weak near its apex, vein 3A straight, but obsolescent. Hind wing with 11 or 12 hamuli, basal ones widely spaced; cell R_1 open; anal cell present, vein 3A represented by a straight stub. Hind tarsus three-quarters as long as hind tibia; tarsal claw with a large basal lobe, Fig. 2. Lancet of saw with 4 pointed teeth on lobes, Fig. 1.

Male: Length, 3.5 mm. Color as in female except that tegula is mostly black, yellow only at apex and lateral margin; pubescence as in female. Relative proportions of parts of antenna: Scape 30, pedicel 25, first flagellar segment 50, second 30, third 30, fourth 25, fifth 25, sixth 25, seventh 25. Legs and wings as in female. Penis valve as in Fig. 3.



Profenusa platanae, n. sp. Fig. 1, saw; Fig. 2, tarsal claw; Fig. 3, penis valve; Fig. 4, ovipositor sheath.

Type locality: Santa Barbara, CALIFORNIA.

Types: U.S.N.M. No. 63460.

Described from 6 ♀ and 6 ♂ specimens, as follows: *Holotype, allotype,* and 2 ♀ and 4 ♂ *paratypes,* Santa Barbara Calif., May 20, 1956, reared from *Platanus racemosa,* Clark O. Eads; 3 ♀ and 1 ♂ *paratypes,* Santa Monica, Calif., June 12, 1956, reared from *Platanus racemosa,* Clark O. Eads. All specimens deposited in the U. S. National Museum collection.

Mature larva: Thorax only slightly thicker than abdomen and of the same width. Length 9.0 mm., width of head 1.1 mm.,

width of metathorax 1.9 mm., width of third abdominal segment 1.9 mm., width at anterior margin of ninth abdominal segment 1.25 mm., width at posterior margin of ninth segment 1.1 mm. Head and legs very pale brown, mandibles brown, body cream colored, dorsal and ventral thoracic shields wanting. Labrum bearing 2 bristles near either lateral margin, a pair of sublateral, arcuate rows of brown micro-denticles borne on lower, inner face of labrum, and a row of smaller, more widely set micro-bristles extending across outer ventral margin of labrum. Each mandible bearing one bristle at base. Clypeus bearing one bristle near either dorso-lateral angle. Antenna with 2 segments, basal one large and almost as broad as long, apical one minute, papilliform. A row of 6 bristles extending across fronto-vertex between the 2 ocellarae. Surface of body obscurely shagreened, not spinulose; spiracles slit-like, not winged; thoracic legs 4-segmented; prolegs present on abdominal segments 2 to 8, and very poorly developed, lacking spines or setae; anal larvapod wanting. Abdominal tergites 2 to 8 each with 2 well-marked annulets, anterior annulet one-third as long as posterior one; posterior end of body blunt.

This is the larva that leaves the mine and drops to the ground to pupate in an earthen cell.

Penultimate larval instar: Thorax wider and thicker than abdomen. Length of body 7.5 mm., width of head 1.1 mm., width of metathorax 1.5 mm., width of third abdominal segment 1.4 mm., width at anterior margin of ninth abdominal segment 1.25 mm.

This is presumably the last larval instar that feeds.

Mine: Begun as a serpentine mine, developing into a blotch mine, the blotch mines commonly multiple and coalescent, in the leaves of *Platanus racemosa.* Excrement in young mines concentrated in the center, in mature mines tending to form bands near lateral margins.

Redescriptions of Ewing's Oribatid Mites, V—Families Belbidae and Opiidae (Acarina: Oribatei) [1]

By Tyler A. Woolley, Department of Zoology, Colorado State University, Fort Collins, Colorado

This paper is the fifth in a series which deals with redescriptions of Ewing's type oribatid mites. The accompanying figures were completed from pencil drawings sent to the writer by Dr. E. W. Baker of the U. S. National Museum. Acknowledgement of these drawings is made by Dr. Baker's initials on the finished plates. Ewing's original descriptions are followed as closely as possible, but the writer incorporates modern acarological terms where needed.

Both Grandjean (1936) and Strenske (1955) indicate features which can be employed to differentiate the genera of the Belbidae. The solenidions, or tactile hairs, constitute one of these morphological features; other characters also are mentioned by these authors. Many of these diagnostic features were not known to Ewing. Most of his descriptions were accompanied by an illustration or two, but in many instances the figures represented single diagnostic features such as a pseudostigmatic organ, lamella, leg, etc. In many cases Ewing did not illustrate the entire mite, which is the situation in some of the belbids described by him.

The descriptions in this paper are as detailed as possible with the information available from Ewing's figures and descriptions and the drawings from Dr. Baker. The figures show the whole body of the mite and the proximal segments of the legs. Solenidions and other critical details are lacking in the descriptions and figures because the writer does not have access to the type specimens. It is impossible to be absolutely certain of the generic designations of all of these mites, but the writer has placed them as accurately as possible. He has used Ewing's designations for some of them until such time as the

[1] Research supported by a grant-in-aid from the National Science Foundation.

type specimens can be examined critically for solenidions and other details. Despite the latter difficulties, these redescriptions should be of value because the fragmentary accounts and illustrations of these mites have been embellished in this paper.

Family Belbidae Willmann, 1931

These apterogasterine mites are distinguished by legs which are longer than the body and frequently consist of bead-like segments. Legs III and IV are usually inserted in the lateral margins of the body and the dorsal surface of the hysterosoma is not reflected ventrally. In some instances the cast nymphal skins are carried on the dorsum of the hysterosoma.

Genus **HETERODAMAEUS**, n. g. (Figs. 1, 2)

Description: Sclerotized sculpturing on dorsum of propodosoma between and anterior to the pseudostigmata; a transverse suture on dorsum of propodosoma at level of insertions of rostral hairs; pseudostigmatic organs large, clavate, setose; dorsum of hysterosoma with four posterior setae in a transverse row adjacent to posterior margin of hysterosoma; surfaces of propodosoma, hysterosoma and legs with many small tubercules; a large spine projecting laterad from the rim of camerostome to the edge of tectopedia I anterior to level of coxae I.

Heterodamaeus magnisetosus (Ewing), 1909. (Figs. 1, 2)

Cotype: *Damaeus magnisetosus* Ewing, 1909, p. 129.

Description: Chestnut brown; propodosoma about two-thirds as long as hysterosoma and about three-fourths as wide, somewhat triangular in shape, surface pebbled with many small tubercles. A transverse, sclerotized ridge and suture between insertions of rostral hairs. Rostrum blunt, depressed; rostral hairs inserted in lateral margins of sclerotized transverse ridge which runs between them, about as long as transverse ridge, stout and pectinate, curved medially until they nearly meet anterior to tip of rostrum. Lateral margins of propodosoma expanded in prominent tectopedia of legs I and II; tectopedia I

larger and directed anteriorly. Lamellae absent. Lamellar hairs fine, simple, inserted about half their lengths anterior to pseudostigmata and directly laterad of antestigmatic bar. Interlamellar hairs not visible, but insertions of these hairs are mediad and anterior of pseudostigmata. Three sclerotized bars or ridges on dorsum of propodosoma anterior to pseudostigmata (fig. 1). Anterior bar curved posteriorly at lateral ends, curved apex at level of tectopedia I in mid-dorsal area of propodosoma. A posterior bar behind and forming an eye-like loop (fig. 1). Two antestigmatic bars which extend between insertions of lamellar and interlamellar hairs and end at antero-lateral margins of pseudostigmata (fig. 1). Pseudostigmata large pits with sclerotized rims at posterior end of antestigmatic bar, mediad of level of tectopedia II, cup projected above surface of propodosoma. Pseudostigmatic organs about as long as leg II, clavate, the head nearly as wide as opening of pseudostigmatic cup and about one-third as long as entire organ, setose (Ewing says: "pectinate"), with a long, thin pedicel, slightly curved, but extended laterally.

Hysterosoma globose, surface pebbled like propodosoma, evidently covered with an exudate, lateral margins bent ventrally slightly; four pairs of visible setae in a transverse row near medio-posterior margin; a pair of glandular fissures (?) in mid-lateral surfaces of dorsum (fig. 1).

Ventral margins of propodosoma with a prominent lateral spine anterior to leg I, extending from lateral rim of camerostome to margin of tectopedia I. Ventral plate circular in outline, about as broad as long, broken on right side in cotype specimen. A single pair of setal insertions visible anterior to genital opening (fig. 2). Genital aperture subrectangular, at level of leg IV. Genital covers as wide as anal covers, but half as long; genital setae not visible. Anal aperture nearly twice as long as genital opening, separated from genital aperture by half the width of a genital cover. Anal covers slightly opened in cotype specimen; no visible anal setae.

All legs with pebbled, tuberculate surface. Ewing (1909) states: "First pair of legs as long as the body; second pair about

three fourths as long as the first pair; third pair equal to the first, and the last pair of legs the longest of all. Tarsus of leg I shorter than the tibia. The tibia of leg I is peculiar in this species in that it possesses a large process or tubercle at its dorsal distal aspect from which arises a large, long, tactile hair. Ungues tridactyle, situated on very long and slender tarsal pedicels; dactyles unequal."

Length 560 μ, hysterosoma 360 μ; width 330 μ.

Specimens of this species were collected in moss by C. A. Hart at Pulaski, Illinois and by H. E. Ewing at Arcola, Illinois.

Discussion: Ewing (1909) considers this species remarkable because of the large pseudostigmatic organs, the tibial projection on leg I, and the shorter length of the second pair of legs. The writer contends that the sclerotized ridges on the propodosoma, the large pseudostigmatic organs, the ventral spines lateral to the camerostome and the four dorsal posterior setae are valid evidences for the generic designation of this species.

Damaeus michaeli Ewing, 1909, p. 129. (Figs. 3, 4)

Description: Chestnut brown; propodosoma broadly triangular in outline, insertions of legs I and II making posterior two-thirds broader than anterior end. Rostrum with a sclerotized margin, somewhat square in outline; rostral hairs curved, stout, inserted in antero-lateral corners of sclerotized margin. Lamellae absent, lamellar hairs inserted twice the width of insertions posterior to rostral hairs; lamellar hairs stout, curved, nearly as long as width of rostrum. Interlamellar hairs inserted between pseudostigmatic organs, directed anteriorly. Pseudostigmata funnel-shaped, placed mediad of space between legs I and II in lateral margin of propodosoma, with a sclerotized rim. Pseudostigmatic organs flagelliform and barbed (Ewing says: "pectinate"), directed laterad and upward. Tectopedia III with stout spines projecting somewhat anteriorly near margin of propodosoma. Spinae adnatae stout, slightly decurved at tips, arising at level of leg III, projected anteriorly from beneath anterior edge of hysterosoma (fig. 3).

Hysterosoma globular, about twice as long as propodosoma, lateral edges curved ventrally, surface brittle, almost smooth, with eight pairs of curved, stout, pectinate bristles in two mediolateral rows on dorsum (fig. 3).

Camerostome pyramidal, with two fine, short bristles near chelicerae. Venter of propodosoma with sclerotized margins, four pairs of bristles lateral and posterior to camerostome (fig. 4), posterior margin of propodosoma with two short, blunt spines which project posteriorly and evidently fit into small recesses in venter of hysterosoma. Genital opening subglobose in outline, about as long as anal aperture, but slightly wider; genital covers rectangular, each cover with six genital setae in a row closer to medial edge than to lateral; g: 1 close to anterior margin of cover; g: 2–g: 6 equally spaced posteriorly. Two pairs of adgenital setae as in fig. 4. Anal opening slightly narrower than genital aperture, oval in outline, covers narrower than genital covers; each cover with two pairs of anal setae; a: 1 closer to anterior margin of anal cover than a: 2 is to the posterior margin (fig. 4). Two pairs of adanal setae near postero-lateral curve of anal aperture. Two pairs of fine, simple setae on decurved surface of dorsal plate, each pair posterolaterad of adanal setae, but with more widely separated insertions.

Ewing (1909) states: "Legs stout; femora with narrow peduncle and large clavate head; each segment bears several stout, curved, pectinate bristles. Portions of cast skin generally carried on the dorsum of the abdomen."

Length 495 μ, hysterosoma 380 μ; width 320 μ.

Many specimens of this species were collected by H. E. Ewing in moss and under bark of logs at Homer, Illinois.

Damaeus globifer Ewing, 1913, p. 120. (Figs. 5, 6)

Description: Chestnut brown. Propodosoma about two-thirds as long as hysterosoma, broadly triangular. Rostrum blunt, cone-like; rostral hairs inserted about a third their lengths posterior to rostral tip on lateral edges, incurved so that tips nearly meet. Lamellae wanting. Lamellar hairs inserted

about a third their lengths posterior and medial to rostral hairs; a sclerotized, raised lateral prominence between rostral and lamellar hairs (fig. 5). Sclerotization of insertions of legs I prominent, visible at lateral margins of propodosoma. Interlamellar hairs inserted medial to pseudostigmata, long, filiform, broken at tips in type specimen. Pseudostigmata prominent, funnel-shaped, between expanded insertions of legs I and II and on slightly raised prominence lateral to insertions of interlamellar hairs. Pseudostigmatic organ long, stout, slightly pectinate. Spinae adnatae stout, curved laterad at tips, inserted about twice their lengths posterior to pseudostigmata. (Ewing (1913) states that these spine-like spurs curve inward, but his illustration in the same article shows them curved outward in the fashion indicated in fig. 5.)

Hysterosoma spherical, smooth, with nine pairs of stout, curved, simple setae on dorso-lateral aspects, their raised insertions arranged in an elongated oval on the dorsum; tips of some bristles broken in type specimen.

Camerostome trapezoidal, a pair of setae posterior to chelicerae and medial to tectopedia I. Apodemata II narrow, decurved bars, medial portion indistinctly projected medio-posteriorly beneath integument. Three simple setae inserted in a diagonal line on each side from level of tectopedia II to level of lateral spine between legs II and III (fig. 6). A large curved, lateral spine at junction of propodosoma and hysterosoma between legs II and III; a small lateral spine projects anteriorly close to base of the large lateral spine. A long lateral spine between legs III and IV. A simple decurved bristle anterior to coxa IV; other ventral setae as shown in fig. 6. Genital opening rectangular, directly between legs IV, each corner rounded, entire aperture ringed with a sclerotized margin; each genital cover with six setae in a row down middle of cover; g:1 inserted close to anterior margin of cover; g:2, g:3, g:4 equidistant from each other; g:5 closer to g:6 than to g:4; all genital setae simple and decurved; a diagonal sclerotized bar in each genital cover and transecting insertion of g:2 (fig. 6). Anal aperture nearly twice the width of peripheral genital band

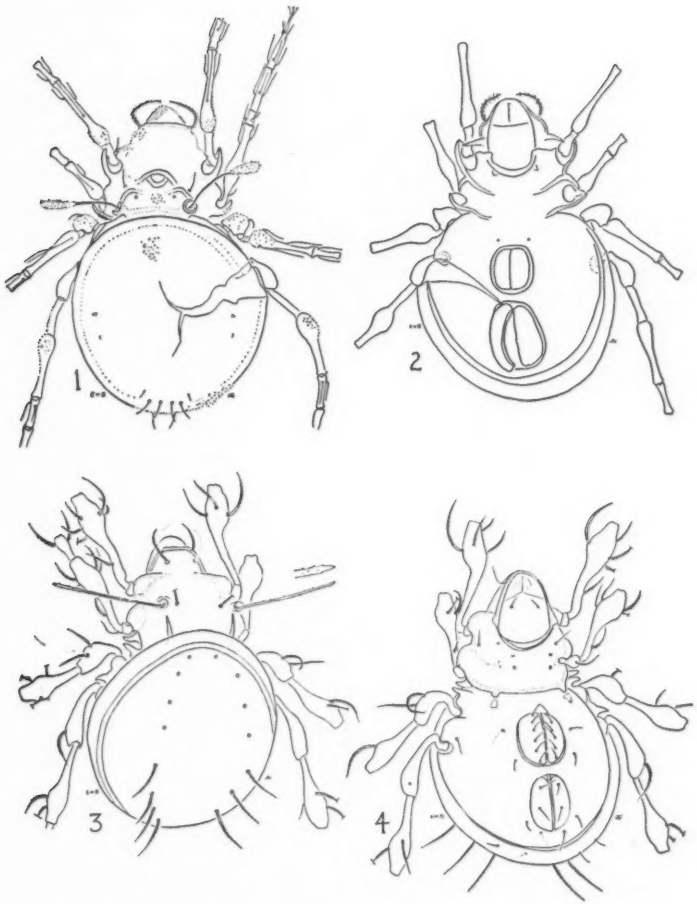


FIG. 1. Dorsal view of *Heterodamaeus magnisetosus* (Ewing). Hysterosoma broken on right side.
FIG. 2. Ventral view of *Heterodamaeus magnisetosus* (Ewing).
FIG. 3. Dorsal view of *Damaeus michaeli* Ewing.
FIG. 4. Ventral view of *Damaeus michaeli* Ewing.

from genital aperture, oval in outline; anal covers opened slightly, each with two simple bristles in medial aspects of cover. Adanal setae as seen in fig. 6.

Ewing's descriptions of the legs is as follows: "All segments of the legs with a swollen portion; second pair of legs subequal to the others. Femora of legs with a thin proximal part; distally suddenly enlarged. Anterior pair of legs about as long as the whole body. Distal end of tibia of leg I without a large tubercle bearing a tactile hair. Femur of leg IV with a very long, tactile bristle at its distal end."

Length 711 μ, hysterosoma 500 μ; width 500 μ.

The type specimen was collected by J. E. Guthrie on decaying mushrooms at Jordan, Minnesota.

Discussion: Ewing indicates that this species is similar to *D. sufflexus* Mich., but the hairs on the dorsum of the hysterosoma are "about twice as long as those of *sufflexus.*" With the current use of solendidions and minute details for differentiation of genera and species, better comparisons cannot be made without study of the type specimens of these belbid mites.

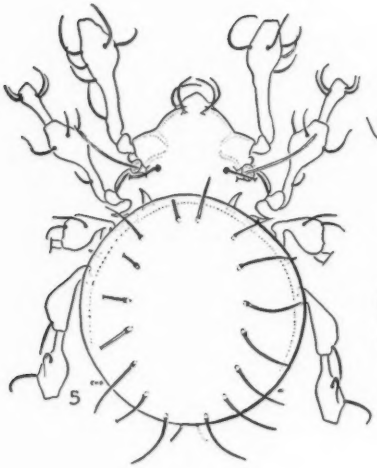
Family Opiidae Grandjean, 1953

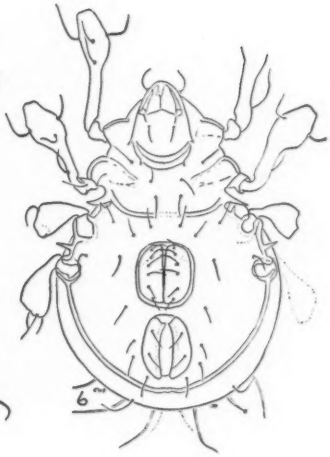
The opiid mites constitute the smallest of the Oribatei. Their coloration is usually light yellowish brown, their legs are like those of most eremaeids, but their body size seems to separate them rather easily from the latter and from other Oribatei. Ewing (1917) used *Damaeus* as the generic designation of one of his mites, which would place it in the family Belbidae. Its propodosomal configurations and its size, however, indicate that it belongs in the Family Opiidae as designated by Grandjean (1953).

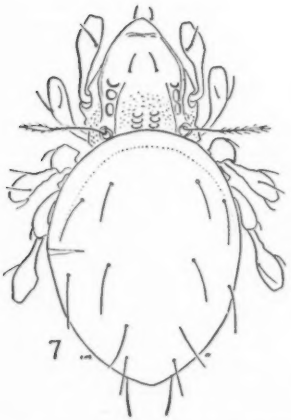
Oppia minuta (Ewing), 1917. (Figs. 7, 8)

Type: *Damaeus minutus* Ewing, 1917, p. 164.

Description: Minute; light yellowish brown, shiny. Propodosoma bluntly pointed anteriorly, with nearly parallel sides, broadest immediately anterior to pseudostigmata, a raised dorsal







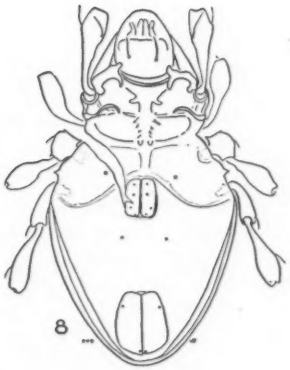


FIG. 5. Dorsal view of *Damaeus globifer* Ewing.
FIG. 6. Ventral view of *Damaeus globifer* Ewing.
FIG. 7. Dorsal view of *Oppia minuta* (Ewing).
FIG. 8. Ventral view of *Oppia minuta* (Ewing).

platform circumscribed by a narrow lateral ridge which extends from pseudostigmata almost to anterior tip of rosturum. Rostrum blunt, rostral hairs short, pilose, strongly curved. Dorsum of propodosoma smooth except for shallow depressions; upper surfaces of tectopedia I and II with small raised tubercles (fig. 7). Lamellae thin lines mediad of pseudostigmata, anterior tips remote from lamellar hairs; lamellar hairs simple, about their lengths apart, inserted on dorsum of propodosoma about twice their lengths from anterior end. Interlamellar hairs absent. Dorsum of propodosoma with three large depressions on either side of raised platform posterior and lateral to lamellar hairs; three pairs of smaller depressions on dorsum between pseudostigmata, arranged in a linear fashion (fig. 7). Pseudostigmata wide cups in postero-lateral margins of propodosoma, with heavily sclerotized rims; pseudostigmatic organs clavo-lanceolate, pectinate, almost straight, extended laterally, with a long, narrow pedicel.

Hysterosoma oval in outline, about two-thirds as broad as long, bluntly pointed posteriorly, smooth and rounded dorsally, with seven pairs of long, curved simple setae; left side of specimen broken.

Camerostome rounded with two long ventral setae in posterior third. Apodemata I and II heavily sclerotized, curved; apodemata III straight bars; apodemata IV curved posteriorly, forming an arch anterior to genital covers; a pair of setal insertions near top of arch; ventral plate broken on right side (fig. 8). Genital opening rectangular, situated at level of leg IV, anterior border partially circumscribed by arch of apodemata IV. Genital covers rectangular, about twice as long as broad; each cover with four genital setae; g:1 and g:2 inserted in middle of anterior half of cover; g:3, g:4 inserted near postero-lateral corner of cover, g:4 closer to posterior margin than g:3 (fig. 8). A pair of setal insertions posterior to genital opening, separated the length of one genital cover. Anal aperture twice as large as genital aperture, rectangular; anal covers slightly broader posteriorly than anteriorly, each cover with two setae; a:1 near lateral margin of cover and a third the length of a single

cover from anterior end; a : 2 inserted in medio-posterior corner of each cover.

Ewing (1917) states that the "legs (are) prominent, but short for the genus; anterior pair extending beyond the tip of the rostrum by over one-half their length, tarsi longer than tibiae, tibiae each with a long tactile hair at its tip above, which extends beyond the tip of the tarsi. Coxae of third pair of legs subspherical in shape, each with a small tubercle on its anterior aspect and a single strongly curved, singly pectinate bristle. Posterior legs extending beyond the tip of the (hysterosoma) by the full length of their tarsi. Most of the segments of the legs are moderately swollen toward one end, and pedicellate at the other end."

Length 293 μ, hysterosoma 207 μ; width 153 μ.

This species was collected in Illinois, but the locality and the collector are unknown. Dr. Ewing had a single specimen "of this very minute and rare species."

Discussion: It seems obvious from the comparisons of this species with drawings and descriptions of genera in Belbidae that the species described above does not belong in any of the belbid genera. Its size and other features of the body conform to the characters of the genus *Oppia,* for which Grandjean (1953) designated the family Opiidae. The configurations on the propodosoma are unlike those of any others the writer has seen in the literature and he therefore considers this to be a valid species in the genus *Oppia.*

References

Baker, E. W., and G. W. Wharton. 1952. An Introduction to Acarology. Macmillan Company, N. Y.

Ewing, H. E. 1909. Jour. N. Y. Ent. Soc. 17: 116–136.

——. 1913. Bull. Amer. Mus. Nat. Hist. 32: 93–121.

——. 1917. Bull. Amer. Mus. Nat. Hist. 37: 149–172.

Grandjean, F. 1936. Ann. Ent. Soc. France 105: 27–110.

——. 1953. Bull. Soc. Zool. France 78: 421–446.

Strenske, K. 1955. Microfaune du sol de l'Eqe Groenland, Volume 1, Arachnides. Expedition Polaires Françaises. Hermann et Cie., Paris.

The Status of the Tortoise Beetle Metriona ormondensis Blatchley

By Milton W. Sanderson, Illinois Natural History Survey, Urbana

In 1920 Blatchley (Can. Ent. 52: 71) described *Metriona ormondensis* on the basis of two specimens taken on wild morning-glory (possibly *Ipomoea*) at Ormond, Florida, April 13, 1913. He mentioned that Barber (1916, Proc. Ent. Soc. Wash. 18: 125) had called attention to a larger, more depressed and more highly colored Florida specimen in the Schaeffer collection which Barber regarded as a local race of *Metriona purpurata* Boh. but which Blatchley thought represented his new species. Schaeffer (1925, Jour. N. Y. Ent. Soc. 33: 233) stated that *ormondensis* possibly was only a variety of *purpurata*. Thus the question of the status of *ormondensis* has remained for more than 30 years.

Through the courtesy of the Department of Entomology at Purdue University, I have been permitted to examine the two Blatchley specimens of *ormondensis*, and I am therefore able to offer some information to support its specific status. Sanderson and King (1951, Jour. Kans. Ent. Soc. 24(4): 125–128) noted the value of the structure of the tarsal claws for sex and species recognition in some species of *Metriona*. Blatchley did not mention the claws of *ormondensis* nor did he indicate the sex of his specimens but examination of the types has disclosed that the type female and the paratype male differ with respect to claws, and that these differ from both sexes of *purpurata*. The anterior claws of both sexes of *ormondensis* each has an inner marginal basal angulation or tooth (hereafter referred to as tooth); one posterior claw is toothed, the other untoothed; both middle claws of the male of *ormondensis* are untoothed; and in the female one claw only is toothed. The female of *purpurata* has all claws toothed except for one untoothed middle claw. These differences for both sexes of the two species are expressed in the following key:

Metriona ormondensis and *purpurata*

1. Each tarsal claw with a broad basal angulation or tooth on inner margin; female.....*purpurata* Boh.
   At least one claw of middle tarsus untoothed.....2
2. Both middle tarsal claws untoothed; male.....
   .....*ormondensis* Blatch.
   Only one middle claw untoothed.....3
3. Only one posterior claw untoothed; female.....
   .....*ormondensis* Blatch.
   Both posterior claws toothed; male.....*purpurata* Boh.

In addition to the foregoing differences, the dorsum of *ormondensis* is duller, and the beetle averages a little larger than *purpurata.*

Nomenclature Notice

All comments relating to the following should be marked with the File Number, and sent in duplicate to Francis Hemming, 28 Park Village East, Regent's Park, London N.W.1, England.

Oeobia Hubner, 1825, and its emendation *Oebia,* suppression of (Order Lepidoptera) (File No. Z.N.(S) 1149).

Attention is also drawn to the proposed adoption of **Declarations**:—(a) clarifying and extending the provisions of the "Code of Ethics" (Z.N.(S) 763); (b) determining the gender attributed to generic names having the terminations "-ides," "-ites," and "-oides" (Z.N.(S) 951); (c) clarifying the procedure to be adopted when a specific name is published in an abbreviated form (Z.N.(S) 1042); (d) clarifying certain problems arising in connection with names published in works written in Latin (Z.N.(S) 1223).

Books Received

BAILEY, S. F. The thrips of California. Part 1, Suborder Terebrantia. Bull. of the California Insect Survey. Vol. 4, No. 5, pp. 143–220. Univ. of Cal. Press, 1957. Price: $1.50.

BOHART, R. M. and E. I. SCHLINGER. California wasps of the genus Oxybelus (Hym. Sphecidae). Bull. of the California Insect Survey. Vol. 4, No. 4, pp. 103–134, 8 pls. Univ. of Cal. Press, 1957. Price: $.75.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Conopidae of the World wanted. Will pay 10¢ to $1.00 for pinned and labelled specimens. S. Camras, 4407 N. Milwaukee Ave., Chicago 30, Illinois.

Anisoptera—Nearctic sp. wanted for exchange, espec. Ophiog., Arigom., Aeschna, Neurocor., Somatoc., Cordulia, Dorocor., Leucor. R. D. Cuyler, Dept. of Entomology, N. C. State College, Raleign, N. C.

Bembicini and Stizini (Hym., Sphec.) of New World wanted for revis. study. Will return upon request or at end of project. James E. Gillaspy, Dept. of Zoology, Univ. Texas, Austin 12, Texas.

Agapema galbina. Will exchange cocoons of this moth for nature books. E. Frizzell, Route 4, Box 96, San Benito, Texas.

Tenebrionidae of the World wanted, in exchange for insects of Argentina and neighboring countries. Horacio J. Molinari, Av. Lib. Gral. San Martin 55, Acassuso (Buenos Aires), Rep. Argentina.

Butterflies. Wish to exchange specimens for Japanese species. Please write to Ichiro Nakamura (Boy, age 16), 26 Aza-Nishiyama Obayashi Takarazuka-shi, Hyogo-Ken, Japan.

Important Mosquito Works

MOSQUITO ATLAS. Part I. The Nearctic Anopheles, important malarial vectors of the Americas, and Aedes aegypti and Culex quinquefasciata

MOSQUITO ATLAS. Part II. The more important malaria vectors of the Old World: Europe, Asia, Africa and South Pacific region

By Edward S. Ross and H. Radclyffe Roberts

Price, 60 cents each (U. S. Currency) with order, postpaid within the United States; 65 cents, foreign.

KEYS TO THE ANOPHELINE MOSQUITOES OF THE WORLD

With notes on their Identification, Distribution, Biology and Relation to Malaria. By Paul F. Russell, Lloyd E. Rozeboom and Alan Stone

Mailed on receipt of price, $2.00 U. S. Currency. Foreign Delivery $2.10.

For sale by the American Entomological Society, 1900 Race Street, Philadelphia 3, Pa., U. S. A.

Just Published

New Classified Price Lists

Available separates from the TRANSACTIONS OF THE AMERICAN ENTOMOLOGICAL SOCIETY and ENTOMOLOGICAL NEWS, and all titles of the Society's MEMOIRS have been catalogued by author in twelve special price lists in the following categories:

Coleoptera	**Neuroptera and Smaller Orders**
Diptera	**Odonata**
Hemiptera	**Orthoptera-Dermaptera**
Hymenoptera	**Arachnida and Other Classes**
Lepidoptera	**Bibliography-Biography**
Memoirs	**General**

Lists will be mailed free upon request. Please state specifically which list or lists you require.

The American Entomological Society
1900 RACE STREET
PHILADELPHIA 3, PENNSYLVANIA

Just Published

MEMOIRS OF THE AMERICAN ENTOMOLOGICAL SOCIETY

Number 15

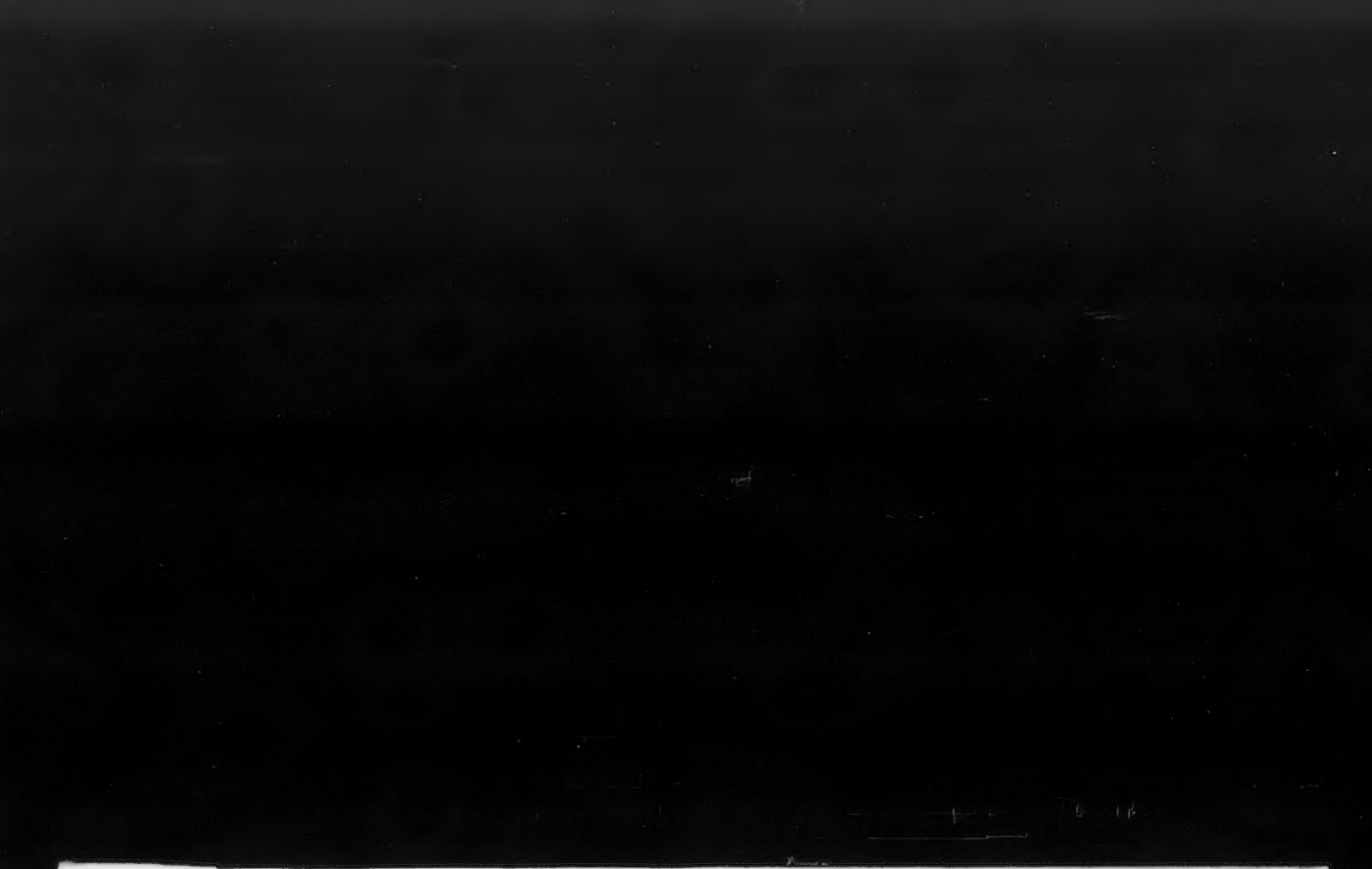
251 pages of text, 19 pages of tables, 7 maps, 47 plates, 3 pages of contents and index

THE NEOTROPICAL SPECIES OF THE 'SUBGENUS AESCHNA' SENSU SELYSII 1883 (Odonata)

By Philip P. Calvert

This paper presents an account of the Neotropical species referred by de Selys in 1883 to his subgenus *Aeschna* and of some species unknown to him. His subgenus is here divided into three genera, *Aeschna, Coryphaeschna,* and *Castoraeschna, Aeshna* in its turn being subdivided into the subgenera *Aeschna, Hesperaeschna, Rhionaeschna, Schizuraeschna, Marmaraeschna* and *Neureclipa.* These five subgenera include 2, 15, 1, 3, 4 and 5 species and subspecies respectively. *Coryphaeschna* embraces 9 species and subspecies, *Castoraeschna* 5. Larvae of 2 species of *Hesperaeschna,* 1 species of *Schizuraeschna,* 1 species of *Neureclipa* and 6 species of *Coryphaeschna* are described and figured. Generalities are discussed under the headings: Relationships of the Neotropical Aeshnas to the North American fossils; Relations of the South American Aeshnas to the Palaearctic and Australian species; The geological age and geographical distribution of the ancestors of the Odonata and of the Mammalia; Relations of the Neotropical Aeshnas to each other; The seasonal distribution of the Neotropical species of Aeshna. Forty plates in black and white illustrate the structural and colorational features of the adults, seven those of the larvae. Nineteen tables show the variations in size and in venation of the adults. Six maps show the geographic distribution of all the species concerned. There is an alphabetical index of species, subgenera, genera, authors quoted, and topics.

Price $10.00 postpaid

THE AMERICAN ENTOMOLOGICAL SOCIETY

1900 RACE STREET, PHILADELPHIA 3, PA.